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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/824,819
Filing Date: April 15, 2004
Appellant(s): DALEY ET AL.

Stephen A. Burch
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 8/2/2010 appealing from the Office action mailed 2/5/2010.

(1) Real Party in Interest

The examiner has no comment on the statement, or lack of statement, identifying by name the real party in interest in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The following is a list of claims that are rejected and pending in the application:

1-6, 8, 9, and 11-17

(4) Status of Amendments After Final

The examiner has no comment on the appellant's statement of the status of amendments after final rejection contained in the brief.

(5) Summary of Claimed Subject Matter

The examiner has no comment on the summary of claimed subject matter contained in the brief.

(6) Grounds of Rejection to be Reviewed on Appeal

The examiner has no comment on the appellant's statement of the grounds of rejection to be reviewed on appeal. Every ground of rejection set forth in the Office action from which the appeal is taken (as modified by any advisory actions) is being maintained by the examiner except for the grounds of rejection (if any) listed under the

subheading "WITHDRAWN REJECTIONS." New grounds of rejection (if any) are provided under the subheading "NEW GROUNDS OF REJECTION."

(7) Claims Appendix

The examiner has no comment on the copy of the appealed claims contained in the Appendix to the appellant's brief.

(8) Evidence Relied Upon

5337413	LUI ET AL	8-1994
20030177144	HOVER	9-2003
6,701,402	ALEXANDER, III ET AL	3-2004

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

Claims 8, 9, 11, 12, 14, 15, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Admitted Prior Art (Fig. 3), hereafter APA, in view of Lui et al. (US005337413A), hereafter Lui, and Hover (US20030177144A1).

- Regarding Claims 8 and 17,

APA discloses a communication system having a main data bus 12 and an extended data bus 14 (claim 8 - main data bus, extended data bus).

APA further discloses a central computer 38 connected to the main bus (claim 8 - a central computer in communication with the main data bus).

APA also shows electronic package 16 (interface) that forms a link between the main bus and extended bus (claim 8 - integrated interface for a communication system that forms link between main data bus and extended data bus).

APA shows that a bus repeater 18 is included in the electronic package, having transceiver 20 coupled to the main bus and transceiver 22 coupled to the extended bus (claim 8 - a bus repeater having a first data interface to couple with a main bus and second data interface to couple with an extended bus; claim 8 - first data interface is a first transceiver and the second data interface is a second transceiver).

APA discloses remote terminal interface control logic 30 also included in the electronic package. However, APA does not explicitly show the logic in direct communication with the bus repeater. APA also does not explicitly disclose the bus repeater or remote terminal is programmable.

Lui discloses an environment monitoring system for standard interface bus computer systems (Title). Referring to Fig. 1, Lui discloses a host adapter 3 (integrated interface) that forms a communication link between a main bus 2 connected to host 1 and an extended bus 2 connected to remote devices 13. Lui shows that the adapter includes a bus repeater 4 and monitor logic 5 that is directly connected to the bus repeater by links 11,12 (claim 8 - a remote terminal in direct communication with the bus repeater).

Lui discloses control logic (Fig. 2) for controlling the operation of the bus repeater when switching between Bypass and Monitor modes, including permitting the transfer,

re-shaping, and direction of data through the adapter 3 (Col. 4, lines 39-42; Col. 7, lines 20-67; claim 8,11 - bus repeater comprises signal filtering and reconstruction control logic that reconstructs received data and controls a transmit/receive direction of data through the bus repeater).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system and interface of APA by directly connecting control logic to the bus repeater within an integrated interface between a main bus and an extended bus, as shown by Lui. This would enable communication from control logic associated with programmable remote devices to the host/central computer without requiring an additional dedicated address port on the adapter (Lui, Col. 2, lines 35-40).

Lui also discloses information used in operating the bus repeater 4, monitoring logic 5, and remote devices 13 can be specified through communication of a control program running on the host processor 1, enabling the controlling (programming/re-programming) of, for example, the ambient temperature of the remote devices 13 (Fig. 1; Col. 5, lines 27-41).

However, Lui does not explicitly disclose programming/re-programming using a high-level programming language.

Hover discloses high-level computer programs such as C++ and the like that are capable of being transmitted to remote devices over a network in order to configure and control parameters such as temperature, power status, etc. (Pg. 2, paragraph 18; claim 8 - at least one of the bus repeater and the remote terminal is a programmable device

capable of being programmed and reprogrammed using a high level programming language; claim 17 – programmable device is programmed in a high level programming language wherein code resulting from programming/reprogramming can be ported to another device).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system and interface of APA and Lui by utilizing a high-level programming language for controlling the temperature of the remote devices, as shown by Hover, thereby improving the ease with which a user can remotely configure and control the system.

- Regarding Claim 9,

APA discloses a communication system and interface that meets all limitations of the parent claims.

APA does not explicitly disclose transceiver 20 or 22 including analog-to-digital conversion circuitry and digital-to-analog conversion circuitry.

However, APA discloses that remote terminal interface control logic 30 receives and responds to messages from the remote terminals 10 over the extended bus after converting the analog signals to a digital format (see Background section of the Specification, Pg. 2, paragraph 5; claim 9 - at least one of the first and second transceivers includes analog-to-digital conversion circuitry and digital-to-analog conversion circuitry).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to implement analog-to-digital and digital-to-analog circuitry in at least one of the transceivers in APA. One of ordinary skill would be motivated to perform this implementation because the remote terminal interface control logic 30 requires analog-digital conversion circuitry to process messages from the remote terminals 10 over the extended bus.

- Regarding Claim 12,

APA discloses a communication system and interface that meets all limitations of the parent claims.

APA does not explicitly disclose the bus repeater comprising programmable signal filter and reconstruction control logic for reconstructing received data and controlling the direction of data through the bus repeater.

Lui discloses information used in operating the bus repeater 4 and monitoring logic 5 can be specified through communication of a control program running on the host processor 1, such as the re-shaping and direction of data through the adapter (Fig. 1; Col. 5, lines 27-41; claim 12 - signal filtering and reconstruction control logic is in a reprogrammable device in the bus repeater).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system and interface of APA by providing programmable control logic for controlling the operating modes of the bus repeater and controlling the direction of data through the interface, as shown by Lui, thereby enabling the bus repeater and

control logic to properly cooperate through common interfaces to the main bus and extended bus.

- Regarding Claims 14 and 15,

APA discloses a communication system and interface that meets all limitations of the parent claims.

APA discloses an example of the system as an aircraft communication system in which the plurality of remote terminals 10 coupled to the extended bus are associated with weapons on the aircraft (see also Background section of the Specification, Pg. 1, paragraph 2; claim 14 – system is an aircraft communication system; claim 15 – plurality of remote device terminals in communication with the extended bus; claim 15 – each remote device terminal associated with an aircraft weapon).

Claims 1-6, 13, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over APA in view of Lui and Hover, and further in view of Alexander, III et al. (US006701402B1), hereafter Alexander.

- Regarding Claims 1, 2, 5, and 16,

APA discloses a communication system having a main data bus 12 and an extended data bus 14. APA further discloses a central computer 38 connected to the main bus. APA also shows electronic package 16 (interface) that forms a link between

the main bus and extended bus (claim 1 - integrated interface for a communication system that forms link between main data bus and extended data bus).

APA shows that a bus repeater 18 is included in the electronic package, having transceiver 20 coupled to the main bus and transceiver 22 coupled to the extended bus (claim 1 - a bus repeater having a first data interface to couple with a main bus and second data interface to couple with an extended bus; claim 2 - first data interface is a first transceiver and the second data interface is a second transceiver).

APA discloses remote terminal interface control logic 30 also included in the electronic package. However, APA does not explicitly show the logic in direct communication with the bus repeater or signal filtering and reconstruction control logic that reconstructs received data and controls a transmit/receive direction of data through the bus repeater.

Lui discloses an environment monitoring ystem for standard interface bus computer systems (Title). Referring to Fig. 1, Lui discloses a host adapter 3 (integrated interface) that forms a communication link between a main bus 2 connected to host 1 and an extended bus 2 connected to remote devices 13. Lui shows that the adapter includes a bus repeater 4 and monitor logic 5 that is directly connected to the bus repeater by links 11,12 (claim 1 - a remote terminal in direct communication with the bus repeater).

Lui also discloses control logic (Fig. 2) for controlling the operation of the bus repeater when switching between Bypass and Monitor modes, including permitting the

transfer, re-shaping, and direction of data through the adapter 3 (Col. 4, lines 39-42; Col. 7, lines 20-67; claim 1,5 - bus repeater comprises signal filtering and reconstruction control logic that reconstructs received data and controls a transmit/receive direction of data through the bus repeater).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system and interface of APA by directly connecting control logic to the bus repeater comprising signal filtering and reconstruction logic within an integrated interface between a main bus and an extended bus, as shown by Lui. This would enable communication from control logic associated with programmable remote devices to the host/central computer without requiring an additional dedicated address port on the adapter (Lui, Col. 2, lines 35-40).

Lui also discloses information used in operating the bus repeater 4, monitoring logic 5, and remote devices 13 can be specified through communication of a control program running on the host processor 1, enabling the controlling (programming/re-programming) of, for example, the ambient temperature of the remote devices 13 (Fig. 1; Col. 5, lines 27-41).

However, Lui does not explicitly disclose programming/re-programming using a high-level programming language.

Hover discloses high-level computer programs such as C++ and the like that are capable of being transmitted to remote devices over a network in order to configure and control parameters such as temperature, power status, etc. (Pg. 2, paragraph 18; claim

1 - at least one of the bus repeater and the remote terminal is a programmable device capable of being programmed and reprogrammed using a high level programming language; claim 16 – programmable device is programmed in a high level programming language wherein code resulting from programming/reprogramming can be ported to another device).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system and interface of APA and Lui by utilizing a high-level programming language for controlling the temperature of the remote devices, as shown by Hover, thereby improving the ease with which a user can remotely configure and control the system.

Neither APA, Lui nor Hover explicitly disclose bus idle detection circuitry in the bus repeater.

Alexander discloses selectively operating a host's device controller in a first or second mode (Title). Alexander discloses logic circuitry for detecting when the bus is idle (Col. 1, lines 55-65; claim 1 - bus idle detection circuit in the bus repeater).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Lui by implementing bus idle detection circuitry, as shown by Alexander, in the bus repeater, in order to provide the bus repeater and control logic of the integrated adapter with an indication of data to be processed over the bus from the host or remote devices.

- Regarding Claim 3,

APA discloses a communication system and interface that meets all limitations of the parent claims.

APA does not explicitly disclose transceiver 20 or 22 including analog-to-digital conversion circuitry and digital-to-analog conversion circuitry.

However, APA discloses that remote terminal interface control logic 30 receives and responds to messages from the remote terminals 10 over the extended bus after converting the analog signals to a digital format (see Background section of the Specification, Pg. 2, paragraph 5; claim 3 - at least one of the first and second transceivers includes analog-to-digital conversion circuitry and digital-to-analog conversion circuitry).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to implement analog-to-digital and digital-to-analog circuitry in at least one of the transceivers in APA. One of ordinary skill would be motivated to perform this implementation because the remote terminal interface control logic 30 requires analog-digital conversion circuitry to process messages from the remote terminals 10 over the extended bus.

- Regarding Claims 4 and 6,

APA discloses a communication system and interface that meets all limitations of the parent claims.

APA does not explicitly disclose the bus repeater comprising programmable signal filter and reconstruction control logic.

Lui also discloses information used in operating the bus repeater 4 and monitoring logic 5 can be specified through communication of a control program running on the host processor 1, such as the re-shaping and direction of data through the adapter (Fig. 1; Col. 5, lines 27-41; claim 4 - at least one of the bus repeater and the remote terminal is a programmable device; claim 6 - signal filtering and reconstruction control logic is in a reprogrammable device in the bus repeater).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system and interface of APA by providing programmable control logic for controlling the operating modes of the bus repeater through the interface, as shown by Lui, thereby enabling the bus repeater and control logic to properly cooperate through common interfaces to the main bus and extended bus.

- Regarding Claims 13,

Lui discloses a communication system and interface that meets all limitations of the parent claims.

Lui does not explicitly discloses bus idle detection circuitry in the bus repeater.

Alexander discloses selectively operating a host's device controller in a first or second mode (Title). Alexander discloses logic circuitry for detecting when the bus is idle (Col. 1, lines 55-65; claim 13 - bus idle detection circuit in the bus repeater).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Lui by implementing bus idle detection circuitry, as shown by Alexander, in the bus repeater, in order to provide the bus repeater and control logic of the integrated adapter with an indication of data to be processed over the but from the host or remote devices.

(10) Response to Argument

Appellant's arguments in the Appeal Brief filed 8/2/2010 have been fully considered but they are not persuasive.

- On pg. 4-6 of the Brief, Appellant contends that Lui fails to show signal filtering and reconstruction control logic contained in the bus repeater, as required by the claims. Appellant argues that the rejection is deficient by equating the control logic of Lui's Fig. 2 to the claimed signal filtering and reconstruction control logic, since the control logic in Lui is not a component of the bus repeater but, rather, is a component of the remote terminal and provides external controls to the bus repeater.
- The Examiner respectfully disagrees. Appellant has mischaracterized the rejection as equating Lui's control logic to the claimed "signal filtering and reconstruction control logic". Rather, the rejection is based upon the control logic of Lui controlling the bus repeater logic (host and drive interface transceivers) for switching between Bypass and Monitor modes. The control

logic performs this controlling of the bus repeater logic via links 11,12. Contrary to Appellant's assertion that the control logic provides "external" controls to the bus repeater, Lui shows that links 11, 12 constitute internal communication lines between the monitor logic and bus repeater portions that make up the "integrated" host adapter 3. While the control logic provides for internal control of the switching between modes via links 11, 12, the only “external” communication involving the host adapter relates to data passing through the bus repeater portion of the host adapter. As such, Lui’s bus repeater contains logic responsible for the "signal filtering and reconstruction" of data passing through, as directed by the control logic control signals communicated over links 11, 12. Therefore, Lui discloses a bus repeater having signal filtering and reconstruction control logic and the rejection is properly maintained.

- On pg. 6 of the Brief, Appellant contends that Lui does not disclose a remote terminal in direct communication with the bus repeater. Appellant alleges that Lui's "communication" is performed on interface bus 2, not on the control lines 11, 12, thus concluding that the control lines are not to be considered communication links in Lui.
- The Examiner respectfully disagrees. Firstly, it is noted that the claimed “direct communication” between the remote terminal and bus repeater does not require any specific type of communication, i.e. the communication of

payload data as opposed to control data. As such, the links of Lui carrying control information between the monitor logic and bus repeater meets the contested limitation. Furthermore, a comparison of Appellant's Fig. 2 and the Admitted Prior Art (Fig. 3), illustrates the underlying concept of Appellant's disclosure. Rather than the control logic 30 of Fig. 3 requiring its own corresponding isolation transformers 34, 28, the control logic is directly connected to the bus repeater in Fig. 2, thereby providing direct communication through a single interface. This is understood to be the "direct communication" as claimed. Further comparison of Appellant's Fig. 2 with Fig. 1 of Lui shows that which is missing from the Admitted Prior Art, i.e. links 11, 12 connecting the monitor logic directly to the bus repeater within the integrated host adapter 3, obviating the need for the monitor logic to have its own connection to the external bus 2 connecting the bus repeater and the storage devices 13. Not only does Lui properly disclose the contested limitation, but is also directed to solving the same problem as that contemplated by Appellant. Therefore, the combination of the Admitted Prior Art with the cited teachings of Lui meet the contested claim limitation of "a remote terminal in direct communication with the bus repeater", and the rejections are properly maintained.

- On pg. 6-7 of the Brief, Appellant contends that Lui's disclosure of "controlling a direction through the bus repeater" and "permitting signals to pass" does not

read upon the claimed “filtering”. Appellant alleges the Examiner's interpretation of "filtering” is improper, based upon the definitions provided in the current specification, including the processing of data sent through the bus repeater. Appellant concludes that one of ordinary skill in the art would consider the claimed signal filtering to be directed to manipulation of the data signal, not merely controlling the direction of the data and permitting the data to pass.

- The Examiner respectfully disagrees. Appellant has adopted an overly narrow interpretation of the claims that reads particular limitations in from the specification without considering the broadest reasonable interpretation consistent with the specification as a whole. Lui clearly shows that data is at least processed through the host and drive interface transceivers 6, 7 of the bus repeater between the host 1 and storage devices 13 when in Bypass mode. A more complete citation from paragraph 19 of current specification states that “signal filtering may include data validation, synchronization, and data bit extraction. Data reconstruction involves resynchronization and data bit insertion of data passing from the main bus to the extended bus. The control logic controls the transmit/receive direction by controlling the operating modes of the first and second transceivers”. One of ordinary skill in the art would consider the cited disclosures of Lui, such as re-shaping data before being transferred from the incoming bus to the outgoing bus (Col. 4, lines 39-42) and controlling the direction of information flow by enabling or disabling

the respective transceivers (Col. 7, lines 20-67), as well as the similarities of "control logic" controlling the operating modes of the first and second transceivers shown in both Appellant's specification and Lui, as falling within this broad definition of "signal filtering and reconstruction" provided by Appellant's specification. Therefore, the rejections are properly maintained.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Gregory B Sefcheck/

Primary Examiner, Art Unit 2477

9-15-2010

Conferees:

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